

## ***IN THE CLAIMS***

Please amend the claims as follows where a copy of the claims with the amendments delineated are set forth below in accordance with the PTO guidelines. This listing of claims will replace all prior versions, and listings, of claims in this application.

### **Listing of Claims**

1. (canceled)
2. (canceled)
3. (New) A system for generating a sequential index of an input value of  $w$  bits in a first list of up to  $2^w$  entries with a set of groupings with each grouping having at least one entry, each of said entries having a width of  $w$  bits, comprising:

a memory having  $2^w$  elements of memory arranged in a first number of rows with each row having a data portion having a second number of elements and each row having a last index portion of a forth number of bits, a third number of bits of the input value are used to select a selected row from said first number of rows, said selected row including a selected data portion and a selected last index portion, where the sum of the second and third numbers is  $w$ ;

a population count device, disposed to receive said selected data portion and said second number of bits of the input value,

for determining whether the input value is one of the entries in said first list,

for generating a first output signal value when the input value is not one of the entries in said first list, and

for generating a population count value when the input value is one of the entries in said first list; and

a sequential index device, disposed to receive said population count value and said selected last index portion, for combining said population count value and said last index value to generate the sequential index when the input value is one of the entries in said first list.

4. (New) The system of claim 3, wherein said population count value represents the number of entries in the list, in said selected row, positioned up to the input value position, that are entries in the first list.

5. (New) The system of claim 4, wherein the number of entries in said selected row position up to the input value position is determined using said second number of bits of the input value.

6. (New) The system of claim 3, wherein said first number is  $2^{w-b}$ , said second number is b, and said third number (w-b).

7. (New) The system of claim 3, wherein said second number of elements can be two or more bits.

8. (New) The system of claim 7, wherein the sequential index can correspond to two or more values.

9. (New) The system of claim 3, wherein the sequential index can correspond to two or more values.

10. (New) The system of claim 3, wherein said data portion includes information regarding the entries of said first list.

11. (New) The system of claim 3, wherein said fourth number of bits is at least the number of bits required to categorize a total number of groupings in the set of groupings.

12. (New) The system of claim 3, where the memory is a random access memory.

13. (New) A method for generating a sequential index of an input value of  $w$  bits in a first list of up to  $2^w$  entries with a set of groupings with each grouping having at least one entry, each of said entries having a width of  $w$  bits, stored in a memory having  $2^w$  elements of memory arranged in a first number of rows with each row having a data portion having a second number of elements and each row having a last index portion of a forth number of bits, comprising the steps of:

selecting a selected row from said first number of rows using a third number of bits of the input value, said selected row including a selected data portion and a selected last index portion, where the sum of the second and third numbers is  $w$ ;

determining whether the input value is one of the entries in said first list,

generating a first output signal value when the input value is not one of the entries in said first list, and

generating a population count value when the input value is one of the entries in said first list; and

combining said population count value and said last index value to generate the sequential index when the input value is one of the entries in said first list.

14. (New) The method of claim 13, wherein said population count value represents the number of entries in the list, in said selected row, positioned up to the input value position, that are entries in the first list.

15. (New) The method of claim 14, wherein the number of entries in said selected row position up to the input value position is determined using said second number of bits of the input value.

16. (New) The method of claim 13, wherein said first number is  $2^{w-b}$ , said second number is b, and said third number (w-b).

17. (New) The method of claim 13, wherein said second number of elements can be two or more bits.

18. (New) The method of claim 17, wherein the sequential index can correspond to two or more values.

19. (New) The method of claim 13, wherein the sequential index can correspond to two or more values.

20. (New) The method of claim 13, wherein said data portion includes information regarding the entries of said first list.

21. (New) The method of claim 13, wherein said fourth number of bits is at least the number of bits required to categorize a total number of groupings in the set of groupings.

22. (New) The method of claim 13, where the memory is a random access memory.

Please cancel claims 1 and 2 without prejudice or disclaimer